

## Abstrak

### Effect of Oral Pomegranate (*Punica granatum*) Peel Aqueous Extract on Macrophage, Fibroblast and Collagen Thickness Burn Wound Healing

Almahitta C. P. \*, Lobredia Z., Iswinarno D. S.  
Department of Plastic Reconstructive and Aesthetic Surgery  
Airlangga University School of Medicine / Hospital Dr. Soetomo  
Surabaya

#### ABSTRACT

**Background:** Burn wound healing is a complex process, which involves the process of inflammation, oxidative stress, and infection. Therefore it is costly both to stabilize the general condition of the body, wound care itself, to prevent and to treat complications. Breakthrough is needed to solve this problem in an effective, safe, and affordable ways. One alternative of the breakthroughs is to use natural ingredients and Pomegranate is one of that ingredient which is widely studied today. Pomegranates have antioxidant effects, anti-inflammatory, anti-infective and anti-carcinogenic due to its content of polyphenols and derivatives, such ellagic acid, punicalagin, etc. Pomegranate polyphenol content higher than other fruits and it's peel contain polyphenols pomegranate highest among other parts. It is known that the aqueous extract of pomegranate peel orally can stimulate healing of incision wound and pomegranate peel extract topically effective for burn wound healing. Research in the effect of oral pomegranate (*Punica granatum*) peel aqueous extract on burn wound healing of white rats have not been investigated.

**Objective:** To proof the effect of oral pomegranate (*Punica granatum*) peel aqueous extract on macrophage, fibroblast, and collagen thickness burn wound healing of white rats.

**Methods:** An experimental with post-test only control group. A total of 28 rats with deep burn wound, divided into four groups: two groups of rats which will be given pomegranate peel aqueous extract 50mg/kgbw/day orally examined at 3 (inflammatory phase) and 10 (proliferative phase) days, and two groups of rats which will not be given the aqueous extract of pomegranate peel oral, examined at 3 and 10 days too. Burn wound will undergo histologic examination with hematoxylin-eosin staining counted the number of macrophages, fibroblast density, and thickness of collagen. Data were analyzed with multivariate analysis of variance analysis (Manova).

**Results:** The number of macrophage at 3 days was similar to the control, but at 10 days control increased significantly ( $P<0,05$ ). The number of fibroblast was significantly higher at 3 days ( $P<0,005$ ) but at 10 days was similar to the control. The collagen thickness at 3 days increased although not statistically significant to the control but at 10 days control decreased significantly ( $P<0,05$ ).

**Conclusion :** Oral pomegranate (*Punica granatum*) peel aqueous extract doesn't decrease macrophage but inhibit its raising, increases fibroblast significantly and increases collagen thickness although not statistically significant.

**Keywords:** *aqueous extract of pomegranate peel, polyphenols, burn wound healing*